

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference RWF/MJM/Y1740	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/GB 03/03936	International filing date (day/month/year) 10/09/2003	(Earliest) Priority Date (day/month/year) 12/09/2002
Applicant LUCITE INTERNATIONAL UK LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

A CATALYST SYSTEM COMPRISING A 1,2-BIS- (PHOSPHINOALKYL) FERROCENE LIGAND

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/G B/03936

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B01J31/24 C07C67/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B01J C07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, COMPENDEX, INSPEC, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96/19434 A (EASTHAM GRAHAM RONALD ; TOOZE ROBERT PAUL (GB); ICI PLC (GB); WANG XIA) 27 June 1996 (1996-06-27) cited in the application page 1, line 13 - line 16 page 3, line 32 - page 4, line 12 page 5, line 18 - line 21; examples	1-51
Y	EP 0 662 467 A (DSM NV ; DU PONT (US)) 12 July 1995 (1995-07-12) page 2, line 1 - line 7 page 2, line 16 - line 17 page 2, line 22 - page 3, line 28 page 3, line 40 - line 45; claims 1-7; examples ----- -/--	1-51

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *G* document member of the same patent family

Date of the actual completion of the international search

5 February 2004

Date of mailing of the international search report

02/03/2004

Name and mailing address of the ISA

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Authorized officer

Seelmann, M

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>HENDRIKUS C.L. ABBENHUIS ET AL.: "Successful application of a "forgotten" phosphine in asymmetric catalysis: a 9-phosphabicyclo[3.3.1]non-9-yl ferrocene derivatives as chiral ligand" ORGANOMETALLICS, vol. 14, 1995, pages 759-766, XP002269207 scheme 1 page 759, right-hand column, last paragraph - page 760, left-hand column, paragraph 1 page 765, left-hand column, last paragraph - right-hand column, paragraph 1</p> <p>-----</p>	1-45, 50, 51
A	<p>WILLIAM C. CULLEN ET AL.: "Structure of the hydrogenation catalyst '(PP)Rh(NBD)ClO₄, PP = ((tBu)₂PC₅H₄)₂Fe and some comparative rate studies" ORGANOMETALLICS, vol. 2, 1983, pages 714-719, XP002269208 phosphines 3 till 6 and preparation of the latter one page 715</p> <p>-----</p>	1-45, 50, 51

INTERNATIONAL SEARCH REPORT

International application No.
GB 03/03936

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1-51 relate to an extremely large number of possible compounds (I), (II) or (XV) and their methods of preparation or catalytic use. Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the subject-matters claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the compounds of the examples, comprising the specific combined structural features of claims 34, 36, 37 and 38, i.e. $M = Fe$, $n = 1$, $m = 0$, $L1 = \text{Cyclopentadienyl}$, $Q1 = P$. Accordingly a structural search has been achieved on the 1,2-bis-(phosphinoalkyl)ferrocene, wherein alkyl = bond or C1 to C10-alkyl group.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

International Application No.

Information on patent family members

PCT/03/03936

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9619434	A	27-06-1996	AT 181725 T	15-07-1999
			AU 701935 B2	11-02-1999
			AU 4309596 A	10-07-1996
			BR 9510249 A	04-11-1997
			CA 2207672 A1	27-06-1996
			CN 1171098 A ,B	21-01-1998
			CZ 9701932 A3	18-02-1998
			DE 69510563 D1	05-08-1999
			DE 69510563 T2	25-11-1999
			DK 799180 T3	31-01-2000
			EP 0799180 A1	08-10-1997
			ES 2133837 T3	16-09-1999
			WO 9619434 A1	27-06-1996
			HU 77016 A2	02-03-1998
			JP 10511034 T	27-10-1998
			NZ 297842 A	28-01-2000
			US 6348621 B1	19-02-2002
EP 0662467	A	12-07-1995	BE 1008018 A3	12-12-1995
			DE 69502299 D1	10-06-1998
			DE 69502299 T2	07-01-1999
			EP 0662467 A1	12-07-1995
			US 5679831 A	21-10-1997